Complete Summary

GUIDELINE TITLE

Evidence based clinical practice guideline for medical management of first unprovoked seizure in children 2 to 18 years of age.

BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for first unprovoked seizure for children 2 to 18 years of age. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2002 Jul 1. 8 p. [35 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

First unprovoked seizure

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management

CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Neurology
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Nurses
Patients
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To provide the most current information and evidence-based recommendations for clinicians evaluating children with first unprovoked seizure

TARGET POPULATION

Children 2 to 18 years of age presenting with a first encounter, unprovoked seizure

These guidelines are not intended for use in the following patients:

- Children with a provoked seizure
- Children with a prior seizure activity/epilepsy
- Children with prior radiological documentation of brain tumor
- Children with a fever at seizure onset
- Children with post-traumatic seizures (within 24 hours of traumatic event)
- Children with a ventriculoperitoneal (VP) shunt
- Status epilepticus (seizure of 30 minutes duration or 30 minutes of intermittent seizure without recovery of consciousness)

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Medical history and physical examination including:
    - Neurological examination
    - Developmental assessment
2. Review recurrence risk
3. Electroencephalogram (EEG)

Note: Laboratory tests (serum glucose, calcium and sodium, toxicology screen) and routine neuroimaging (computed tomography [CT], magnetic resonance imaging [MRI]) were considered but not recommended.

Management

1. Withhold anticonvulsant medication
2. Provide patient and family education, including:
    - How to handle seizure activity
    - Injury prevention

MAJOR OUTCOMES CONSIDERED

- Rate of seizure recurrence

- Efficacy of laboratory testing, neuroimaging and electroencephalogram (EEG) as diagnostic tools
- Risk of subsequent harm from seizures
- Side effects of anticonvulsant medication

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The recommendations contained in this document were formulated by a working group including community and hospital based physicians, nurses, and pharmacists, who examined current local clinical practices and performed extensive and critical literature reviews.

During formulation of these guidelines, the committee members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guidelines have been reviewed and approved by clinical experts not involved in the development process, senior management, Risk Management & Corporate Compliance, the Institutional Review Board, other appropriate hospital committees, and other individuals as appropriate to their intended purposes.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Each recommendation is followed by evidence grades (A-X) identifying the type of supporting evidence. Definitions of the evidence grades are presented at the end of the Major Recommendations field.

Note: Children less than 2 years of age were excluded from this guideline because they are more likely to have metabolic, infectious, and structural causes for a first seizure. (Warden, Brownstein, & Del Beccaro, 1997 [D]; McAbee, Barasch, & Kurfist, 1989 [C]; Hauser et al., 1982 [C]; Garvey et al., 1998 [D]).

Assessment, History, and Physical

It is recommended that a thorough history and physical examination including a detailed neurologic examination and developmental assessment be performed in children presenting with an apparent first, unprovoked seizure. (Arts et al., 1999 [C])

- The initial assessment and history for a first, unprovoked seizure are crucial in determining baseline functioning and the diagnostic modalities selected.
- Focal onset seizures and seizures associated with new, persistent focal deficits are more likely to be caused by intracranial lesions (tumor, stroke, abscess,

vascular malformation) (Shinnar et al., 2001 [C]; Stroink et al., 1998 [C]; Warden, Brownstein, & Del Beccaro, 1997 [D]; Gibbs et al., 1993 [D]; Sjors, Blennow, & Lantz, 1993 [D]; Gilles et al., 1992 [D]; Landfish et al., 1992 [D]; McAbee, Barasch, & Kurfist, 1989 [C]; Garvey et al., 1998 [D]).
- It is important to elicit history from the family/caregivers/patient as it regards to possible unrecognized seizure activity. (Arts et al., 1999 [C]; Local Expert Consensus [E])

Recurrence Risk

It is recommended that the prognosis in children presenting with a first unprovoked seizure be reviewed with the child/family.

- The highest recurrence risk after the first unprovoked seizure is in the first year at approximately 40% (95% Confidence Interval [CI] 33%, 48%). The rate of recurrence decreases dramatically beyond the first seizure-free year after a first unprovoked seizure. The probability for recurrent seizures in children with a first unprovoked seizure plateaus at approximately 60% after 2-3 years. (Ramos Lizana et al., 2000 [C]; Stroink et al., 1998 [C]; Shinnar et al., 1996 [C])
- The recurrence rate at two years varies by neurologic history. Only about one-third of those children with previously normal cognition and motor function and no prior neurological injury will have had a seizure recurrence after two years. However, in children with previously abnormal cognition or motor function, it is found that about two-thirds of them will have had a seizure recurrence after 2 years. (Shinnar et al., 1996 [C])
- Almost 90% of children whose seizures recur do so within 2 years of the initial event. (Shinnar et al., 1996 [C])

Laboratory

Routine laboratory studies are NOT recommended for children with first unprovoked seizures. Laboratory tests are of little value in evaluation of first, unprovoked seizure in children over 2 without prolonged post-ictal confusion.

- In six studies involving 202 children, the following abnormalities were detected: glucose (3 patients), calcium (5), and sodium (7). Most abnormal sodium and calcium levels were in children under 2, and half were suspected by history. Lab error was not excluded in all cases. (Rider et al., 1995 [D]; Landfish et al., 1992 [D]; Nypaver et al., 1992 [D]; Eisner et al., 1986 [C]; Turnbull et al., 1990 [C]; Garvey et al., 1998 [D])
- A toxicology screen has been useful when the history suggests ingestion or exposure to illicit drugs. (Mott, Packer, & Soldin, 1994 [D])

Neuroimaging

Routine neuroimaging (magnetic resonance imaging [MRI]/computed tomography [CT]) is not recommended in children with first unprovoked seizures unless the history, physical exam, or neurologic and developmental assessment suggest focality or deterioration/delay, in which case an MRI is the procedure of choice. (Hirtz et al., 2000 [O]; Local Expert Consensus [E])

- In evaluating children with first unprovoked, non-focal seizure, neuroimaging is of low yield.
- Life-threatening lesions requiring emergency treatment were not found as the cause of first unprovoked seizure in any published cases meeting inclusion criteria for this guideline.
- A recent study confirms previous results that less than 2% of neuroimaging in patients with first unprovoked seizures reveals clinically significant findings affecting treatment or management decisions. Selection for neuroimaging (53% of the study group) was primarily because focality or other clinical reasons were present. (Shinnar et al., 2001 [C]; Hirtz et al., 2000 [O])
- In a retrospective study of 3,291 children aged 0 to 20 years in the Childhood Brain Tumor Consortium Database, 14% (461) had seizures. Ninety-one percent (91%) of those with either supratentorial or infratentorial tumors presented with at least one other symptom and 92% with at least one other neurological sign. Therefore, at most, 37 patients (1.3%) presented with only seizures (Refer to Table 1 in the original guideline.) (Sjors, Blennow, & Lantz,1993 [D]; Gilles et al., 1992 [D])
- In a retrospective study of 99 consecutive children with brain tumors in Sweden, 10% had seizures occur before the tumor was diagnosed. Nine of 10 had focal seizures, the tenth had an "asymmetric generalized seizure." (Sjors, Blennow, & Lantz, 1993 [D])
- In studies of children with epilepsy, diagnostic accuracy of MRI was up to 30% greater than head CT. (King et al., 1998 [C]; Resta et al., 1994 [D])

Electroencephalogram (EEG)

It is recommended that patients with an apparent first unprovoked seizure be considered for neurologic evaluation after consultation between the parents and treating physician. Neurologic consultation may be more beneficial in situations where the diagnosis is equivocal after a thorough history and physical or in cases of persistent parental anxiety. (Local Expert Consensus, [E])

- Subgroups of patients with a first unprovoked seizure may vary in the diagnostic and prognostic yield from an EEG. The need for a routine EEG following a first unprovoked seizure and the information gained from it is optimized if the EEG is obtained in conjunction with a neurologic evaluation. (Camfield & Camfield, 2000 [D]; Gilbert & Buncher, 2000 [O])
- In previously normal children, one-year recurrence risk with an epileptiform EEG is 44%, versus 20% for a non-epileptiform EEG. (Shinnar et al., 1996 [C])
- The 24% difference in one-year recurrence risk is too small a difference to support any change in behavioral interventions; i.e. counseling about driving, swimming, etc. will not be affected by the results of the EEG. (Gilbert & Buncher, 2000 [O])
- Performing a second EEG in children with a normal first EEG has no predictive value for recurrence after a first unprovoked seizure. (Stroink et al., 1998 [C])
- The American Academy of Neurology guidelines, which have been endorsed by the American Academy of Pediatrics, recommend the EEG as part of the neuro-diagnostic evaluation of the child with an apparent first unprovoked seizure. (Hirtz et al., 2000 [O])

Treatment

It is recommended that treatment be withheld in children with a first unprovoked seizure.

- Because of the low recurrence risk, the lack of evidence of harm from a first or recurrent seizure, and the potential side effects of anticonvulsant medication, expert consensus is to withhold anticonvulsant treatment after a first unprovoked seizure. (Camfield, 1997 [E]; Wyllie, 1994 [E]; Freeman & Vining, 1992 [E]; Shinnar & Ballaban-Gil, 1991 [E]). There are no studies that adequately assess whether treating a first unprovoked seizure changes a child's prognosis for epilepsy or any other adverse central nervous system (CNS) outcome.
- A randomized trial of treatment of first unprovoked seizure that included 114 children under 16 years of age showed no significant difference in the probability of seizure remission between children treated or untreated after one seizure. (Musicco et al., 1997 [A])
- In a retrospective population-based study of 479 children with epilepsy, delaying treatment with anticonvulsants for up to 10 seizures did not appear to adversely affect prognosis. (Camfield et al., 1996 [D])

Education

It is recommended that education for the patient and family be geared toward decreasing fear and promoting an understanding of the seizure event. Education is an important part of this guideline and should help parents share in the decisions needed for evaluation of their child. It is important to provide information on how to handle any seizure activity that may occur in the future. It is advised that education begin at the point of entry to the health care encounter.

It is recommended that discussion of the risk of injury be held with caregivers of a child after a first, unprovoked seizure. Children with seizure disorders have been found to be at elevated risk of injury during play, recreation, and activities of daily living such as bathing. (ILAE, 1997 [E]; Diekema, Quan, & Holt, 1993 [D])

- Children with seizure disorders have been found to be at significantly elevated risk of drowning and injury. It is recommended that parents never leave children who have confirmed or suspected seizure disorders alone in a bathtub or swimming area. (Diekema, Quan, & Holt, 1993 [D]) Furthermore, it is advised such children always wear a helmet and other protective gear when riding on bicycles, skateboards, or motorized recreational vehicles. Finally, it is recommended that potentially suffocating bedding be avoided (especially in younger children and infants). (ILAE, 1997 [E])

Definitions

Evidence Based Grading Scale:

A: Randomized controlled trial: large sample
B: Randomized controlled trial: small sample
C: Prospective trial or large case series

D: Retrospective analysis
E: Expert opinion or consensus
F: Basic laboratory research
S: Review article
M: Meta-analysis
Q: Decision analysis
L: Legal requirement
O: Other evidence
X: No evidence

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is identified for each recommendation (see "Major Recommendations").

Evidence Based Grading Scale:

A: Randomized controlled trial: large sample
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L: Legal requirement
O: Other evidence
X: No evidence

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Effective medical management of first unprovoked seizure in children 2 to 18 years of age

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These guidelines are a set of recommendations resulting from review of literature and practices current at the time of their formulations. This protocol does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the guidelines to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The physician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The implementation process for each Cincinnati Children's Hospital Medical Center (CCHMC) guideline is a phase in a larger process of Guideline Development. This process is utilized for every guideline but is not addressed in the content of every guideline.

At the start of each guideline, a projected implementation date is determined. Reservations for education are then made (Grand Rounds, Patient Services Inservices). When the guideline is complete and enters into the Approval Process, Education planning begins. Changes created by the guideline are outlined as well as anticipated outcomes. The implementation date is confirmed. Education is provided. The guideline is implemented and pilot information collection started. The Guideline Coordinator makes daily rounds and eligible children are followed to document the use of the guideline. The implementation phase aids in finding areas for improvement or question. When issues identified are improved the guideline progresses to the monitoring phase.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999 Jun 28 (revised 2002 Jul 1)

GUIDELINE DEVELOPER(S)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

SOURCE(S) OF FUNDING

Cincinnati Children's Hospital Medical Center

GUIDELINE COMMITTEE

First Unprovoked Seizure Guideline Team

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Community Physician: Robert Krzeski (Chair)

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CHMC Residents: Barbara Hallinan; Scott St. Clair

Nursing/Patient Services: Shirley Salway

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence-based clinical practice guideline for medical management of first unprovoked seizure in children 2 to 18 years of age. Cincinnati (OH): Children's Hospital Medical Center (CHMC); 1999 Jun 28. 13 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Cincinnati Children's Hospital Medical Center.

For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Children's Hospital Medical Center Health Policy and Clinical Effectiveness Department at HPCEInfo@chmcc.org.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available:

- Seizures. Cincinnati, OH: Cincinnati Children's Hospital Medical Center, 1999. (Patient Education Pamphlet 1055).

Available online at the Cincinnati Children's Hospital Medical Center Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on September 20, 1999. The information was verified by the guideline developer as of November 15, 1999. The summary was updated by ECRI on January 6, 2002. The information was verified by the guideline developer on January 27, 2003.

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